Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A sensor system comprising:

a first and second transmit signal chain for transmitting signals at respective first and second frequencies;

a first and second receive signal chain for receiving reflections of the signals transmitted by the corresponding first and second transmit signal chains; and

a signal processing unit for evaluating respective reflections received by the first and second receive signal chains to determine whether or not an object is composed of one type of material or of another type of material, the evaluation comprising a comparison of the ~~respective~~ reflections received by the first ~~and second~~ receive signal ~~chains~~ chain to the reflections received by the second received signal chain, which comparison is measured against a benchmark that indicates whether or not an object is of one type of material or another type of material;

wherein the first and second frequencies are selected such that ~~a different~~ the ratio of the amount of energy ~~from signals transmitted~~ reflected at the first frequency to the amount of enegy reflected at the second frequency ~~is reflected~~ by the one type of material[[s]] ~~of one type~~ is significantly greater than the ratio of the amount of energy reflected at the first frequency to the amount of energy reflected at the second frequency by the other type of material ~~from signals transmitted at the second frequency, and where similar amounts of energy are reflected by objects of another type from signals transmitted at both the first and the second frequencies~~.

Claim 2 (original): The sensor system of claim 1, wherein the signal processor calculates a magnitude ratio of the respective reflections received by the first and second receive signal chains, which is then compared to the benchmark.

Claim 3 (original): The sensor system of claim 1, wherein the first and second frequencies are radio frequencies in the C-band and K-band respectively.

Claim 4 (original): The sensor system of claim 3, wherein the reflections are decomposed into In-phase and Quadrature channels of both the first and second frequencies.

Claim 5 (original): The sensor system of claim 1, wherein the first and second frequencies are both acoustic frequencies.

Claim 6 (original): The sensor system of claim 5, wherein the reflections are decomposed into In-phase and Quadrature channels of both the first and second frequencies.

Claim 7 (currently amended): The sensor system of claim 1, wherein the objects of one type of material are ~~animate objects~~ animal or human and the objects of another type of material are ~~inanimate objects~~ non-animal and non-human.

Claim 8 (original): The sensor system of claim 1 mounted onto the underside of a vehicle between the front and rear wheel assemblies.

Claim 9 (currently amended): A method of sensing comprising:

i) transmitting signals on first and second frequencies;

ii) receiving reflections of the transmitted signals at the first and second frequencies;

iii) processing the received reflections of the transmitted signals to determine whether or not objects are present; and

iv) if objects are present, further processing the reflections to determine whether or not objects are of a certain type of material or not, wherein the processing of the respective received reflections at the first and second frequencies to determine whether or not objects are of the certain type of material or not includes comparing the ~~respective~~ reflections received at the first ~~and second frequencies to~~ frequency to the reflections received at the second frequency and measuring the comparison against a benchmark to determine whether or not an object is of the certain type of material or not;

wherein the first and second frequencies are selected such that ~~a different~~ the ratio of the amount of energy ~~from signals transmitted~~ reflected at the first frequency to the amount of enegy reflected at the second frequency ~~is reflected~~ by the certain type of material[[s]] ~~of one type~~ is significantly greater than the ratio of the amount of energy reflected at the first frequency to the amount of energy reflected at the second frequency by other types of material ~~from signals transmitted at the second frequency, and where similar amounts of energy are reflected by objects of another type from signals transmitted at both the first and the second frequencies~~.

Claim 10 (original): The method of sensing according to claim 9, wherein the processing of the reflections to determine whether or not objects are of the certain type of material or not includes calculating a magnitude ratio of the respective reflections at the first and second frequencies, which is then compared to the benchmark.

Claim 11 (original): The method of sensing according to claim 9, wherein the first and second frequencies are radio frequencies in the C-band and K-band respectively.

Claim 12 (original): The method of sensing according to claim 11, wherein the reflections are decomposed into In-phase and Quadrature channels of both the first and second frequencies.

Claim 13 (original): The method of sensing according to claim 9, wherein the first and second frequencies are both acoustic frequencies.

Claim 14 (original): The method of sensing according to claim 13, wherein the reflections are decomposed into In-phase and Quadrature channels of both the first and second frequencies.

Claim 15 (currently amended): The method of sensing according to claim 9, wherein the objects of one type of material are ~~animate objects~~ animal or human and the objects of another type of material are ~~inanimate objects~~ non-animal and non-human.

Claim 16 (original): The method of sensing according to claim 9 further comprising the step of subtracting a static clutter estimation from the respective reflections received at the first and second frequencies.

Claim 17 (new): The sensor system of claim 1, wherein the first and second transmit signal chains include pulse generators for transmitting the signals at respective first and second frequencies as electromagnetic pulses.

Claim 18 (new): The sensor system of claim 17, wherein the reflections are decomposed into In-phase and Quadrature channels of both the first and second frequencies.

Claim 19 (new): The method for sensing according to claim 9, wherein the signals transmitted on the first and second frequencies are transmitted simultaneously.

Claim 20 (new): The method of sensing according to claim 9, wherein the signals transmitted on the first and second frequencies are transmitted as electromagnetic pulses.

Claim 21 (new): The method of sensing according to claim 20, wherein the reflections are decomposed into In-phase and Quadrature channels of both the first and second frequencies.

Claim 22 (new): The sensor system of claim 1, wherein the signal processor subtracts a static clutter estimation from the respective reflections received at the first and second frequencies.

Claim 23 (new): The sensor system of claim 22, wherein the reflections are decomposed into In-phase and Quadrature channels of both the first and second frequencies.

Claim 24 (new): The sensor system of claim 1, wherein the reflections are decomposed into In-phase and Quadrature channels of both the first and second frequencies.

Claim 25 (new): The method of sensing according to claim 16, wherein the reflections are decomposed into In-phase and Quadrature channels of both the first and second frequencies.

Claim 26 (new): The method of sensing according to claim 9, wherein the reflections are decomposed into In-phase and Quadrature channels of both the first and second frequencies.

Claim 27 (new): The method of sensing according to claim 9, wherein the signals transmitted in step i) are unobstructed prior to engaging any objects present and the signals received in step ii) are unobstructed.